

MULTIPLE (QUAD) NPN SILICON DUAL IN-LINE AND FLATPACK SWITCHING TRANSISTOR

Qualified per MIL-PRF-19500/559

Devices

2N6989
2N6989U

2N6990

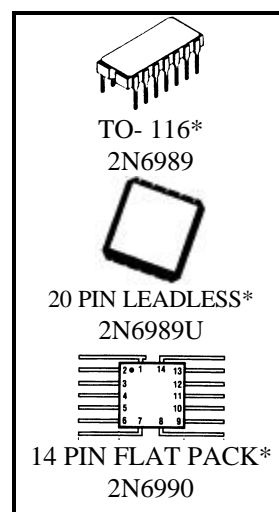
Qualified Level

JAN
JANTX
JANTXV
JANS

MAXIMUM RATINGS ⁽¹⁾

Ratings	Symbol	Value	Units
Collector-Emitter Voltage ⁽³⁾	V _{CEO}	50	Vdc
Collector-Base Voltage ⁽³⁾	V _{CBO}	75	Vdc
Emitter-Base Voltage ⁽³⁾	V _{EBO}	6.0	Vdc
Collector Current ⁽³⁾	I _C	800	mAdc
Total Power Dissipation @ T _A = +25°C 2N6989 ⁽²⁾ 2N6989U ⁽²⁾ 2N6990 ⁽²⁾	P _D	1.5 1.0 0.4	W
Operating & Storage Junction Temperature Range	T _{op} , T _{stg}	-65 to +200	°C

- 1) Maximum voltage between transistors shall be ≥ 500 Vdc
- 2) Derate linearly 8.57 mW/°C above T_A = +25°C for 2N6989 and 2N6989U
Derate linearly 2.286 mW/°C above T_A = +25°C for 2N6990
Ratings apply to total package.
- 3) Ratings apply to each transistor in the array.



*See appendix A for package outline

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage I _C = 10 mAdc	V _{(BR)CEO}	50		Vdc
Collector-Base Cutoff Current V _{CB} = 60 Vdc V _{CB} = 75 Vdc; I _c = 10 μAdc	I _{CBO}		10 10	ηAdc μAdc
Emitter-Base Cutoff Current V _{EB} = 4.0Vdc V _{EB} = 6.0Vdc; I _c = 10 μAdc	I _{EBO}		10 10	ηAdc μAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽⁴⁾				
Forward-Current Transfer Ratio $I_C = 0.1 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 150 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 500 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	h_{FE}	50 75 100 100 30	325 300	
Collector-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$ $I_C = 500 \text{ mAdc}, I_B = 50 \text{ mAdc}$	$V_{CE(sat)}$		0.3 1.0	Vdc
Base-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$ $I_C = 500 \text{ mAdc}, I_B = 50 \text{ mAdc}$	$V_{BE(sat)}$	0.6	1.2 2.0	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 20 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$	$ h_{fe} $	2.5	8.0	
Forward Current Transfer Ratio $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	h_{fe}	50		
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		8.0	pF
Input Capacitance $V_{EB} = 0.5 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{ibo}		25	pF

(4) Pulse Test: Pulse Width = 300 μ s, Duty Cycle \leq 2.0%.